Soil Carbon Sequestration: Science, Technology & Economics

a Joint DOE-CSiTE USDA-CASMGS Symposium

1:15 - *Soil C Sequestration: Science & Potential.* CW Rice (Kansas State U.) and FB Metting (Pacific NW NL)

1:35 - *Importance of Sequestration Duration & C Saturation to Estimates of Soil Capacity*. TO West (Oak Ridge NL)

1:55 – *What are the Economic Costs of Measuring & Monitoring Soil C*? S Mooney (U. Wyoming)

2:15 – *Modeling Approaches for Understanding & Predicting Soil C Sequestration*. K Paustian (Colorado State U.) & RC Izaurralde (PNNL)

2:35 – *Competitiveness of Soil C as an Option: A Bridge to the future*? B McCarl (Texas A&M) & R Sands (PNNL)

2:55 – *Economics: Accounting for Permanence, Leakage & Additionality*. BC Murray (Research Triangle Inst.)

Break

Soil Carbon Sequestration: Science, Technology & Economics

Break is over…

3:45 – *Electric Utility Industry Perspective on Terrestrial Sequestration.* G Kaster (American Electric Power)

4:05 – *Role of Aggregation & Rigorous Management in Creation of Agricultural C Offsets* . JA McMorris (AgCert International)

4:25 – *Estimating Agricultural Soil Sequestration Potential Using the Opportunity Cost Approach.* SM Capalbo (Montana State U.)

4:45 – *Regional GHG Mitigation Response & Leakage Effects.* BJ DeAngelo (US EPA)

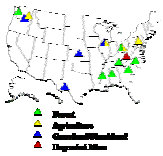
5:05 – *Carbon Sequestration in the U.S. Greenhouse Gas Inventory.* M Walsh (ICF Consulting)

5:25 – *Project Specific or Performance Standard Baseline?* A Sommer (RTI International)

Thank You !!

DOE Consortium for Research on ***Enhancing***

Carbon
Sequestration
in
Terrestrial
Ecosystems



DOE-SC National Laboratories
- Argonne National Laboratory
- Oak Ridge National Laboratory
- Pacific Northwest National Laboratory

DOE-FE
- National Energy Technology Laboratory

Universities
- Colorado State University
- University of California - Davis
- Cornell University
- North Carolina State University
- Ohio State University
- Rice University
- Texas A&M University
- University of Washington

Research Institutions
- Joanneum Inst for Energy Res, Austria
- USDA Center for Forested Wetlands Res, SC
- USDA Land Mgmt & Water Cons Unit, WA
- USDA Coshocton Watershed

Consortium for Agricultural Soil Mitigation of Greenhouse Gases

- *To provide the tools and information to successfully implement soil carbon sequestration so that*
  - *the accumulation of greenhouse gases is lowered in the atmosphere,*
  - *while providing income and incentives to farmers and improving the soil.*

Kansas State University
Iowa State University
Montana State University
Ohio State University
Texas A&M University
Colorado State University
Michigan State University
University of Nebraska
Purdue University
Pacific Northwest National Labs

CASMGS Objectives

- Processes and mechanisms controlling soil C sequestration and GHG emissions.
- Evaluate rates of C sequestration of different agricultural practices.
- Provide measurement and modeling tools to quantify and verify soil carbon sequestration.
- Provide assessment of economic and policy strategies for carbon sequestration.
- Identify other benefits of practices that sequester carbon.
- Outreach.

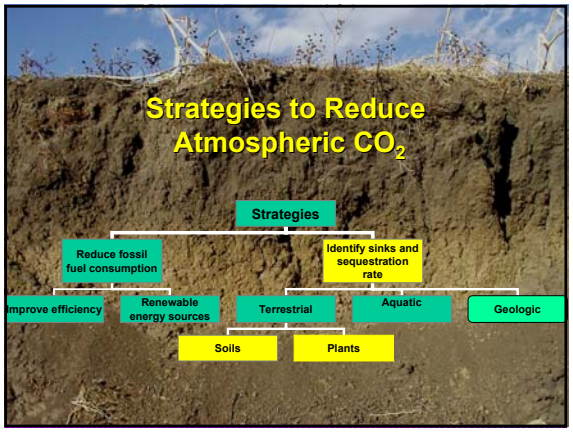
Soil Carbon Sequestration: Science and Potential

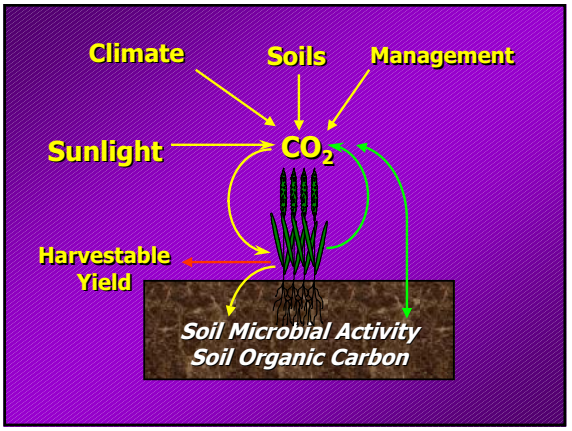
Charles W. Rice
Dept. of Agronomy

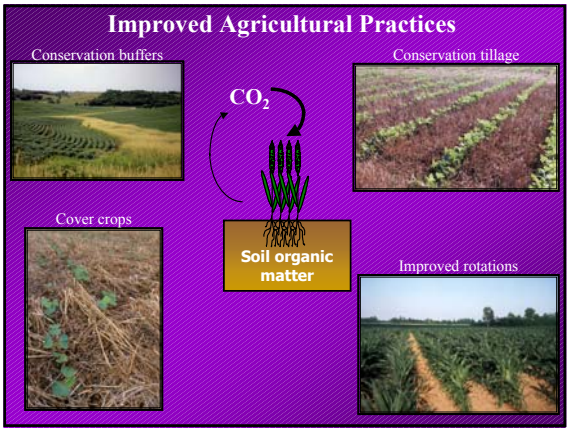
Blaine Metting
PNNL

CASMGS
Consortium for Agricultural Soil Mitigation of Greenhouse Gases

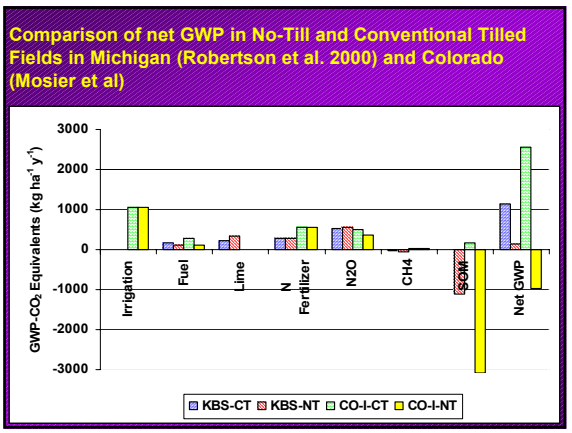
K-State Research and Extension



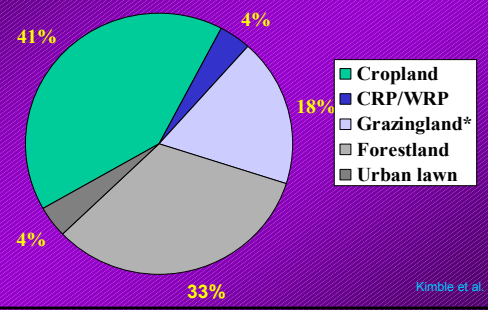




Treatment	Scenario	Rate (Mg C/ha/y)	Duration (yrs)	State
Eliminate sum. fallow	4-year system Continuous cropping	0.117 0.229	12	Eastern Colorado
Corn Management	NT 150 N manure NT 150 N Fert	1.19 1.05	10	NE Kansas
Rotations	CT - NT wheat CT - NT sorghum	0.764 0.605	10	SC KS
Annual Cropping	NT Organic	0.30 0.08	10	MI
Farming systems	NT corn NT corn rotate w/ alfalfa and manure Corn-soybean with poultry manure	0.379 0.760 0.392	14 20 13	Ohio, ne.
CRP		0.80	12	NE



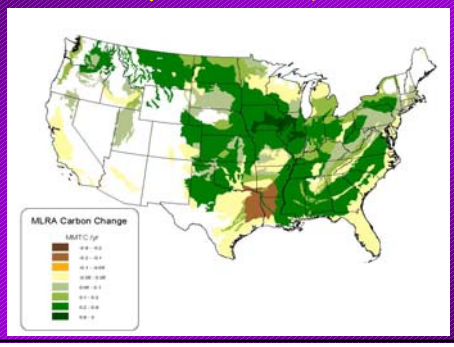
Soil C sequestration potential of different US land Categories (% of 322 MMT C/yr) **



Kimble et al.

Preliminary inventory results--Century

21.2 MMTC yr^{-1} on 149 Mha cropland



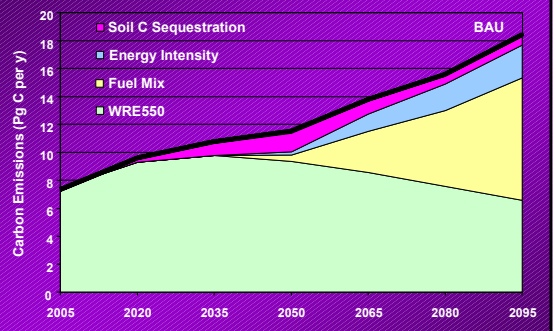
Potential of U.S. Agriculture for Mitigation

Scenario	MMTC/yr
C sequestration in cropland	132
C sequestration in CRP	13
C sequestration in rangelands	58
Biofuel production (C offset)	~50
Saving in fuel consumption	1-2
Reduction of C emission from eroded sediments	~15
Total	270

US emissions: ~1750 MMTC/yr

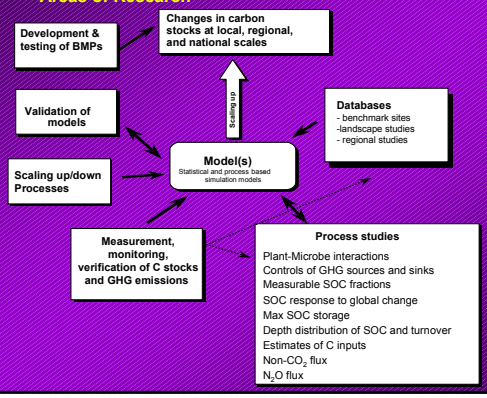
Lal et al., 1999, 2003

Carbon Emissions Reductions: WRE 550 with Soil Carbon Sequestration Credits

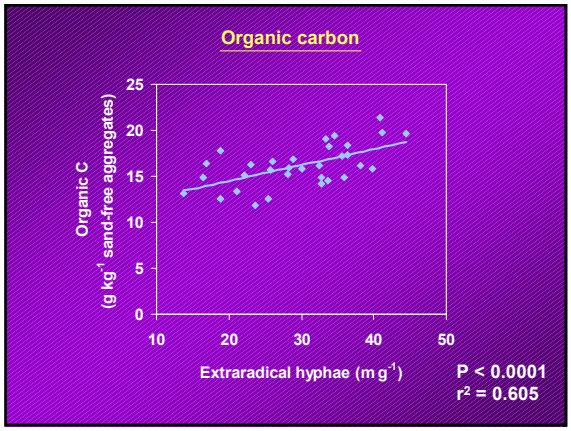


From: Rosenberg, N.J., R.C. Izaurralde, and E.L. Malone (eds.). 1999. Carbon Sequestration in Soils: Science, Monitoring and Beyond. Battelle Press, Columbus, OH. 201 pp.

Areas of Research



The importance of hyphal interactions with soil: Aggregation



- Team
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